REMARKS

Summary of claim changes

By this Amendment, independent claim 1 has been replaced with new independent claim 50 which incorporates the subject matter of claim 9, claims 2-7, 10-17, 20, 22 and 24 which depend from claim 50 have been amended, new independent claim 51 has been added which incorporates the subject matter of claim 8, and new dependent claims 52-74 which depend either directly or indirectly from new claim 51, have been added. New claims 52-74 correspond to the pending claims as follows:

New	Pending	New	Pending
52	2	63	15
53	3	64	16
54	4	65	17
55	5	66	18
56	6	67	19
57	7	68	20
58	10	69	21
59	11	70	22
60	12	71	23
61	13	72	24
62	14	73	25
		74	26

Claims 8 and 9 have been cancelled herein. Claim 27 was previously cancelled, and claims 28-49 which were previously not elected in response to a Restriction requirement, have now been cancelled. Upon entry of this Amendment, the claims will be new independent claim 50, with claims 2-7 and 10-26 depending therefrom, and new independent claim 51, with claims 52-74 depending therefrom. It is respectfully requested that the Examiner review and consider the foregoing amended and new claims in view of the following remarks.

Brief description of the invention

Before addressing the Office Action, a brief description of the subject invention will be provided to assist the Examiner and facilitate the following discussion, but it is not intended for the purpose of limiting the claimed invention in any way. Applicants' invention is directed to a process for manufacturing composite parts which are capable of being subjected to high mechanical stress. The composite parts are made up of a precomposite formed of reinforcement fibers which are embedded in a matrix based on a composition comprising a resin of the type which can be hardened when subjected to ionizing irradiation. The inventive process includes the formation of the precomposite, stacking sections (or lengths) of the precomposite onto each other about a support, and applying pressure to the stacked sections under a selected temperature to complete the molding of the composite parts.

In order to form the precomposite to the desired consistency, the precomposite is prepolymerized by subjecting it to ionizing irradiation until it forms a medium with the properties described on pages 6-7 of the present specification. Use of ionizing radiation to trigger the polymerization makes it possible not only to reach this desired consistency, but also makes it

possible to stop the polymerization process by stopping emission of the irradiation so as not to exceed a maximum level of polymerization, as explained in the paragraph that begins on page 10, lines 17. This inventive technique permits the stacked sections of the precomposite to be worked so as to constitute a block of any shape and thickness, and which can withstand high mechanical stress.

In order not to exceed the maximum level of polymerization, a determination must be made as to when to stop the application of the ionizing irradiation to the resin-based matrix. As explained on page 11 of the specification, this determination can be made based on empirical data of the Shore D hardness index of the final composite as derived from different Shore D hardness values of the precomposite in order to achieve a desired final composite Shore D hardness level. In particular, with knowledge of a desired or "target" Shore D hardness level of the final composite, the application of ionizing irradiation to the precomposite will be stopped when the ratio of the precomposite Shore D hardness to the final composite Shore D hardness is within the range of 0.5 to 0.7. See page 11 of the specification, lines 4-14. This feature, which was recited in now-cancelled claim 9, has been incorporated in new independent claim 50 which is essentially a combination of an earlier version of claim 1 with now-cancelled claim 9.

In another approach, empirical data of the glass transition temperature (Tgf) of the final composite is derived from different glass transition temperature (Tgpr) values of the precomposite. More specifically, if a temperature index T is defined as T=Tgf - Tgpr, with Tgpr being the glass transition temperature of the precomposite, and if the desired range of values of T is known, e.g., between 40°C to 130°C, the irradiation of the precomposite can be limited in order to achieve the desired T value of the final composite. (See page 11, line 15 through page

12, line 3 of the specification). This feature is recited in claim 8 and has been incorporated into new independent claim 51.

Rejection under 35 USC 112 has been overcome

Turning now to the Office Action, claims 1-26 stand rejected under 35 U.S.C. §112, second paragraph. Specifically, claim 1 has been rejected because the term "rubber" is unclear. Claims 12-14 have been rejected because there is no antecedent basis for the phrase "the different lengths". Also, claim 14 has been rejected because the term "high viscosity" is a relative term and is, therefore, indefinite.

In response to these rejections, new independent claims 50 and 51 do not include the term "rubber". Therefore, this basis for the rejection is now moot. Regarding claims 12-14, these claims have been amended in a self-explanatory manner. Lastly, claim 14 is supported by page 13, lines 10-12 of the specification. The term "high viscosity" is understood by anyone with ordinary skill in the art not by considering it in a vacuum of information but, rather, as being dependent on the other factors pertaining to the invention which are clearly, fully and specifically disclosed in the present specification. Thus, a detailed definition of this term would be superfluous.

In view of these claim amendments and the above-presented comments, it is respectfully submitted that the rejection under 35 U.S.C. §112, second paragraph, has been overcome.

All the pending claims are patentable under 35 USC 103

Turning now to the merits, the Examiner has rejected claims 1-4, 7-9, 11 and 16-23 as being obvious over U.S. Patent No. 4,092,443 (Green) in view of U.S. Patent No. 5,145,621 (Pratt). Claims 5 and 6 stand rejected as being obvious over Green and Pratt, and further in view of U.S. Patent No. 5,439,353 (Cook et al.). Claim 10 stands rejected as being obvious over Green and Pratt, and further in view of U.S. Patent No. 4,065,340 (Dickerson). Claim 14 stands rejected as being obvious over Green and Pratt, and further in view of U.S. Patent No. 3,840,985 (Miller). Claim 15 stands rejected as being obvious over Green and Pratt, and further in view of U.S. Patent No. 6,060,124 (Ikegawa et al.). Claims 24 and 26 stand rejected as being obvious over Green and Pratt, and further in view of U.S. Patent No. 4,734,144 (Markow) and U.S. Patent No. 6,117,258 (Spragg et al.). Lastly, claim 25 stands rejected as being obvious over Spragg et al., Markow et al., Green and U.S. Patent No. 6,248,450 (Voss et al.).

The Examiner has indicated that claims 12 and 13 would be allowable if rewritten to overcome the rejections under 35 U.S.C. §112, second paragraph, and to include the limitations of the base claim and any intervening claims. These claims have been kept in dependent form, and should be allowed with claim 50 from which they depend.

As discussed above, independent claim 50 incorporates the features of claim 9. Also, new independent claim 51 incorporates the features of claim 8. Based on these amendments, it is believed that only the "obviousness" rejection in the Office Action pertaining to claims 8 and 9 needs to be addressed in detail.

Regarding claims 8 and 9, the Examiner states (Office Action, page 5, lines 7-13) that "the references [Green and Pratt] do not disclose how much of the radiation-curable resin is cured, though it (sic) does indicate that different amounts can be cured." The Examiner then refers applicants to the examples set forth in Green and further states that the "claimed ranges are simply methods of categorizing the percentage of resin cured, and the use of such methods to determine the amount of cure would be within the skill of one in the art." Applicants respectfully disagree.

Green discloses the formation of prepregs by impregnating a fibrous material with a resin and with a heat-activated curing agent, and then exposing the impregnated material to radiation for solidifying the liquid composition. Examples 1-25 in Green simply provide different recipes and process criteria for forming the prepregs. A review of these examples reveals that although the amount of time the compound is exposed to the radiation is specified, the examples do not set forth a technique for ceasing exposure of the radiation based on (1) based on a desired range of values for the ratio of the Shore D hardness index value of the precomposite to the Shore D hardness index value of the final composite (as is now recited in new independent claim 50) , or (2) a desired range of values between the glass transit temperature of the precomposite and the glass transit temperature of the final composite (as is now recited in new independent claim 51).

In addition to the admission set forth in the Office Action that Green and Pratt fail to disclose how much of the radiation-curable resin is cured, the Office Action fails to cite any prior art reference to establish the allegation that it "would be within the purview of one in the art" to determine the amount of curing as set forth in claims 8 and 9. Such a rejection is not in accord with the applicable case law and PTO procedures. *In re Grose*, 592 F.2d 1161, 1167-68,

201 USPQ 57, 63 (CCPA 1979) ("[W]hen the PTO seeks to rely upon a chemical theory in establishing a prima facie case of obviousness, it must provide evidentiary support for the existence and meaning of that theory"). *See also, MPEP Sec. 2144.03.* Thus, not only do the cited references fail to teach or suggest the methods as now set forth in claims 50 and 51, but the Examiner has not met the burden of proof required for a *prima facie* "obviousness" rejection regarding claims 8 and 9.

For all of the foregoing reasons, it is respectfully submitted that independent claims 50 and 51 are in condition for allowance. For at least these reasons, all the remaining pending claims are also believed to be allowable.

Should the Examiner have any comments, questions, suggestions, or objections the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of such matters.

A total of 49 claims is now pending. Since fees have already been paid covering this total, no additional claims fee is due.

It is believed that, other than the time extension fee, no additional fees or charges are required at this time in connection with the present application. However, if any additional fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
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October 4, 2004